Installing and Using PPR

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29 January 2004

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Abstract

This document is intended to help you to get PPR up and running as quicly as possible. It does not attempt to describe all of PPR's features or theory of operation. More information can be found in *PPR, a Print Spooler for PostScript*, the *PPR Reference Manual*, and the *PPR Hackers Guide*.

Installation

Obtaining the PPR Source Code

The PPR source code may be obtained by anonymous FTP from ftp://ppr-dist.trincoll.edu/pub/ppr/. If you prefer to use HTTP, the URL is http://ppr-dist.trincoll.edu/pub/ppr/. The file size is about 4 megabytes.

Unpacking, Compiling, and Installing PPR

The PPR source code comes as a tar archive compressed with gzip. To unpack it use this command:

```
# gunzip -c ppr-X.XX.tar.gz | tar xvf -
```

Where X.XX is the PPR version number. This command will uncompress and unpack the source code and deposit it in a directory called `ppr-1.50` which it will create in the current directory.

Compiling and installing PPR consists of 4 basic steps:

1. Running the **Configure** script
2. Running **make**
3. Running **make install**

These steps are described in detail in the file `INSTALL.txt` which may be found in the top level source code directory. There you will find list the of packages which it is required or recomended that you install before building and runing PPR. That file also has and has notes about how PPR gets along with various operating systems.

Setting a Default Alert Destination

When PPR detects that something is wrong with a printer, it can inform an operator by e-mail. The e-mail address of the operator to be informed is specified for each individual printer. Also specified is how long a problem must persist before the operator should be alerted. There are default settings which are copied into the configuration of each newly created printer. As soon as you have installed the spooler you should set the default alert settings which will be applied to new printers. You do it with a command like this one:

```
# ppad new alerts 5 mail alertreaders@myorg.org
```

After this command has been executed, then the configuration of each printer you add will be set so that on every fifth printer fault a notice will be mailed to <alertreaders@myorg.org>.

Filter Setup

One of the last things **make install** does is run **ppr−index filters** The **ppr−index filters** command searches for certain programs which it will be able to use to convert files you may want printed to PostScript. These programs include Troff, TeX, DVIPS, the NetPBM utilities, and the Adobe Acrobat Reader. For those that are found in the current path, PPR generates small shell scripts in `/usr/lib/ppr/filters/`. Later, PPR calls these shell scripts to automatically convert input files to PostScript.

If you later add or remove programs which PPR uses or could use as filters, you should re−run `ppr-index filters`.

Starting and Restarting the PPR Spooler

When you have finished running the spooler install script, you are ready to start the spooler daemons for the first time.

The Manual Way

You can start it manually with the following commands:

```
# /usr/lib/ppr/bin/pprd
# /usr/lib/ppr/bin/papd
```

The first command starts the spooler daemon, the second starts the server for Macintosh clients. Any daemons needed for AppleTalk should be started before starting **papd**. For example, if AppleTalk is provided be Netatalk, you should start Netatalk's daemon **atalkd** before starting **papd**.

To shut them down, use these commands:

```
# /usr/lib/ppr/bin/papd --stop
Sending SIGTERM to papd (PID=10163).
Waiting while papd shuts down....
Shutdown complete.
# /usr/lib/ppr/bin/pprd --stop
Sending SIGTERM to pprd (PID=25524).
Waiting while pprd shuts down....
Shutdown complete.
```

You may of course use the **kill** command to kill the processes. If you do though, remember that it is important to never kill **papd** with the command **kill −9** or **kill −KILL** unless gentler means have already failed.

One reason this is important is because, depending on which AppleTalk implementation you are using, **papd** may have to call shutdown code to remove the advertised names from the AppleTalk network. If killed by SIGKILL, **papd** will be unable to call the shutdown code and the names will remain. You might then have to stop and restart the AppleTalk protocol stack to get rid of them. Until you get rid of them, you will be unable to restart **papd** and any Macintosh clients which attempt to print to the now dead names will probably crash.

The Automatic Way

The above paragraphs describe how to start and stop the PPR daemons individually with simple Unix commands. There are other, more automated ways to do it. For example, if your system uses a System V style **init**, you can stop all of the PPR daemons and once by finding the `init.d` directory (which is in different places in different operating systems) and running the **ppr** script which PPR installed there with the parameter **stop**. The example below will work on most System V derived and recent Linux systems. Here we start and then stop the PPR daemons:

```
# /etc/init.d/ppr start
Starting PPR daemons: pprd papd
# /etc/init.d/ppr stop
Stopping PPR daemons: pprd papd
```

PPR's User, Operator, and Administrator Interfaces

There are three principal ways of interacting with PPR. These are the command−line interface, the web−browser interface, and the Perl/Tk interface.

The Command Line Interface

The command−line interface is the most complete. All of the other interfaces use the command−line interface in the background. The principal commands are **ppr**, **ppop**, and **ppad**.

The **ppr** command is used to submit print jobs. It works much like **lpr** or **lp**. If a filename is specified on the command line, it is printed, otherwise the data to be printed is ready from stdin. The `-d` is used to specify the queue to which to submit the job. Other options are available to control such things as multiple copies, duplexing, and user notification of the job's fate.

The **ppop** command is the command which users and operators use to control the spooler. All users can list queues delete, move, hold, etc. their own jobs. Users who have been granted operator's rights can do the same to anyone's job. They can also mount forms, start and stop printers, and perform similiar tasks that don't alter the spooler configuration. A user can be granted operator access by adding his username to `/etc/ppr/acl/ppop.allow`.

The **ppop** command is structured as a series of subcommands. For example, **ppop list** will list a queue while **ppop cancel** will cancel a job.

The **ppad** command is the one which the system administrator uses to alter the spooler's configuration. Ordinary users can use it to view but not alter the spooler configuration. Users who have been granted spooler administrator access by adding their usernames to `/etc/ppr/acl/ppad.allow` can alter the spooler configuration. For example, they can add and delete printers.

Like the **ppop** command, the **ppad** command is a container for many subcommands. For example, **ppad show** will display the configuration of a printer while **ppad comment** will change its description.

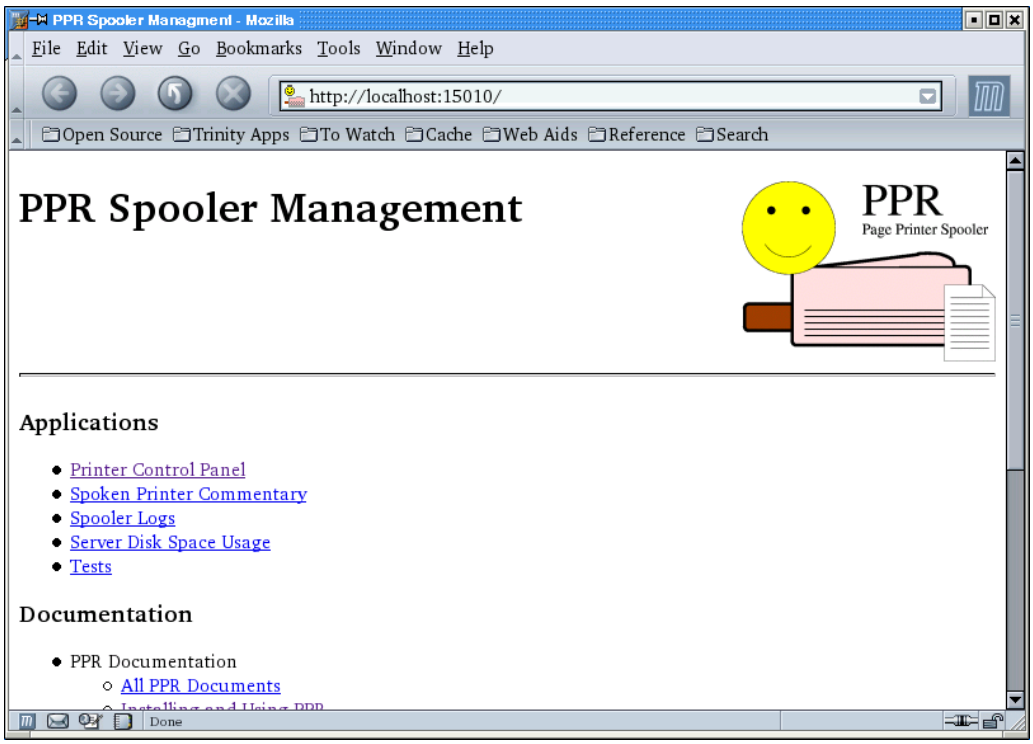
This manual will provide many examples of the use of these commands. Complete explanations of all of their options and subcommands can be found in their man pages.

The Web–Browse Interface

The web–browser interface is the second most complete. It provides a way to manage jobs and create, modify, and delete print queues. It does not provide a way to submit jobs other than test pages. In a modern browser such as Mozilla, the interface looks more like a modern GUI than a typical web–browser interface.

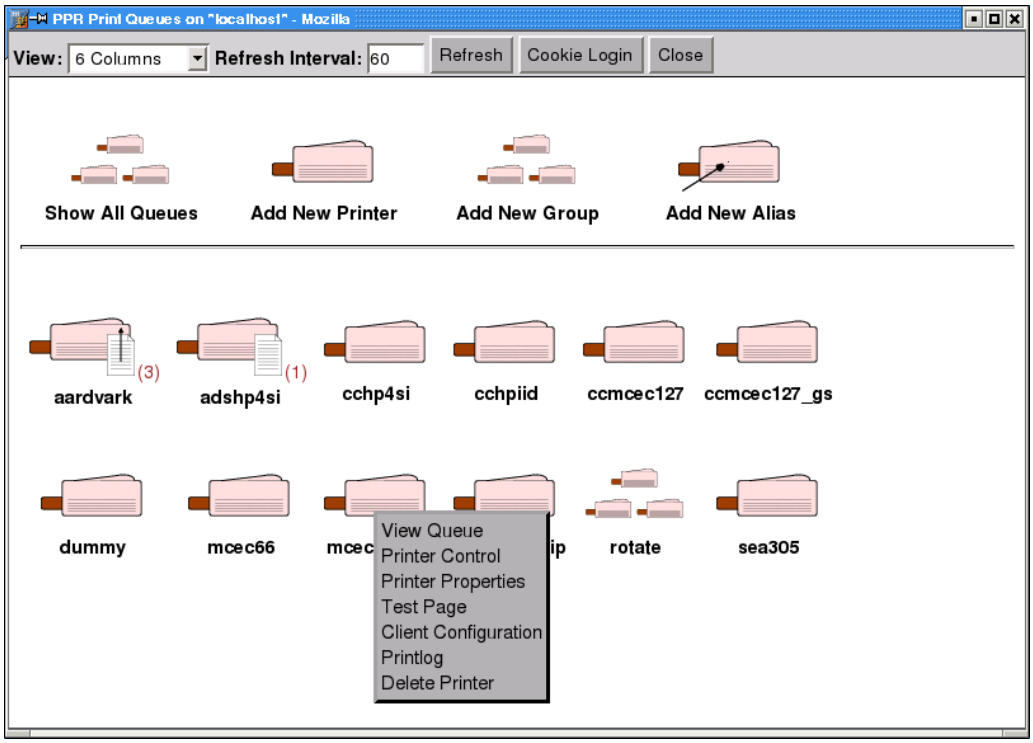
One reaches the web–browser interface by connecting to port 15010 on the print server. This is illustrated in figure Figure 1 below.

Figure 1. Opening the PPRWeb–Browser Interface



The first page which one sees provides links to a number of things including PPR documentation and the PPR web–browser interface. The web browser interface is shown in figure Figure 2 below.

Figure 2. PPR's Web Control Panel



Some of the operations which you can perform using the web interface require authentication and authorization. If you are running the web browser on a Linux system and connecting to the same system using the address `localhost`, then PPR will be able to determine which user is on the other browser side of the connection. Under any other circumstance, you will have to present a username and password.

The PPR web–browser interface will not accept your system password. It could only do so if you were to send your password over the net where it would be succeptible to eavesdropping. Instead it uses what is known as "digest" HTTP authentication. In this sceme, your browser proves to the server that you have told it your password by treating it as a number and answering obscure questions about its mathmatical properties. However, in order to participate in this game, the server needs to have your password encoded in a particular way. The upshot is that you must use a special password setting program to set the password for the PPR web–browser interface. Actually, the first time, a system administrator (root or someone listed in `/etc/ppr/acl/passwd.allow` must do this for you, like this:

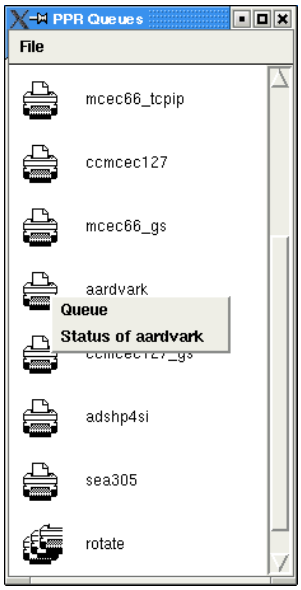
```
# ppr-passwd --add jjones
```

All authenticated users have the same level of access as they would have at the command line. This means that they can do things to their own jobs, but everthing else, such as the spooler configuration, is read–only for them. A user can be granted a greater level of access by adding him to the access control lists for the **ppop** and **ppad** commands as described above.

The Perl/Tk Interface

The Perl/Tk interface is the least mature. It currently provides a way to print files, view and manage queues, view printer status, and start and stop printers. It does not provide any way to alter the spooler configuration. There are also some gaps in the functions which it does provide.

Figure 3. The Perl/Tk Control Panel



Adding Printers

This section has several parts. This is because adding printers may be a multi−step process. For example, you might add a printer to PPR, them make it a member of a PPR group, then tell Samba about it, then add it to the printers shared by PPR's AppleTalk print server.

Adding Printers to the Spooler

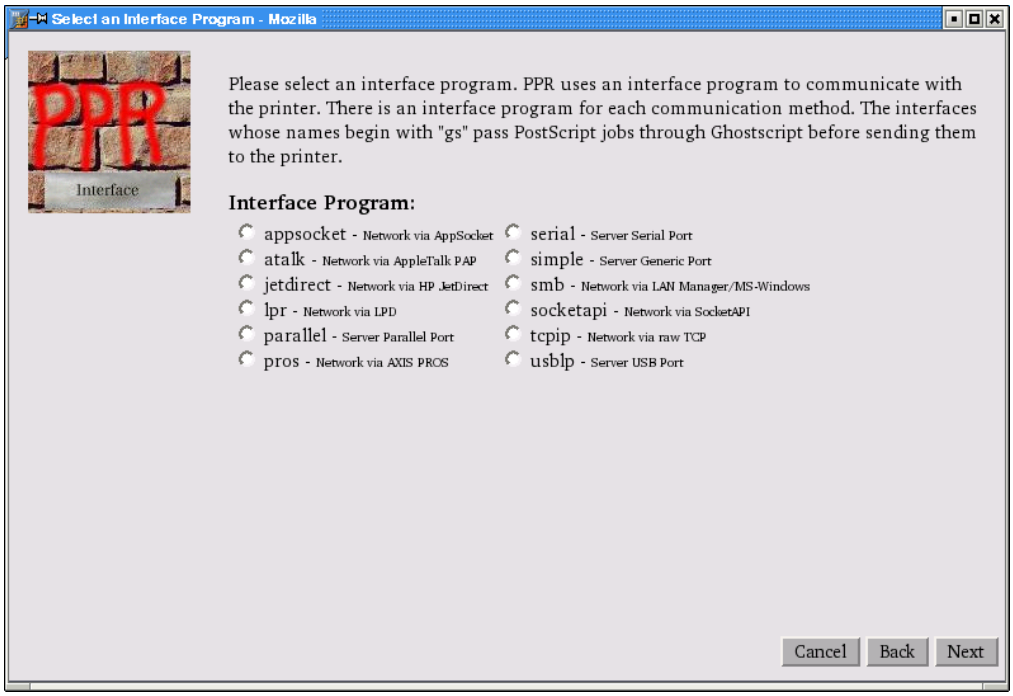
Printers may be added without stopping the PPR spooler. A new printer queue is created using the command **ppad interface**. This command sets the interface program and address for a printer queue. An interface is a the program which PPR uses to communicate with the printer. A good example is the one called `atalk`. The `atalk` interface allows PPR to print on Apple LaserWriters" and other printers which implement Apple's Printer Access Protocol (PAP), such as many QMS and HP printers.

Interface may sometimes require the settings of options in addition to the address. In the sections below, a few of the more often required options will be mentioned, but you may later wish to have a look at the ppad−interfaces(8) manpage which is the definitive reference for interface programs and their options. It also describes additional interface programs which are not mentioned here.

In the sections below we will discuss some of the more popular interface programs and explain how to use them. We will show you how to use the **ppad** to create a new printer queue, choose an interface, and set other options.

However, you may find it easier to use the web interface. PPR's web interface provides an add printer wizard which will present you with a series of questions and then compose and execute the necessary **ppad** commands. It will even show you the commands it executes in case you are curious or wish to incorporate them into a script. An early screen of the Add Printer Wizard is shown in figure Figure 4. To reach the Add Printer Wizard, go to the PPR Web Control Panel and click on the icon labeled "Add a Printer".

Figure 4. Choosing the Interface in the Add Printer Wizard


Select an Interface Program - Mozilla
PPR
Interface
Please select an interface program. PPR uses an interface program to communicate with the printer. There is an interface program for each communication method. The interfaces whose names begin with "gs" pass PostScript jobs through Ghostscript before sending them to the printer.
Interface Program:
appsocket - Network via AppSocket
atalk - Network via AppleTalk PAP
jetdirect - Network via HP JetDirect
lpr - Network via LPD
parallel - Server Parallel Port
pros - Network via AXIS PROS
serial - Server Serial Port
simple - Server Generic Port
smb - Network via LAN Manager/MS-Windows
socketapi - Network via SocketAPI
tcpip - Network via raw TCP
usblp - Server USB Port
Cancel
Back
Next

Adding a Printer With an AppleTalk Interface

Before you can add an AppleTalk connected printer to PPR you must determine its complete AppleTalk name. The complete AppleTalk name has three parts. The first is the printer's individual name, this is the name you see in the Macintosh Chooser. The second part is the AppleTalk type which is almost certainly `LaserWriter`. The third part is the AppleTalk zone which you can also find in the Chooser. HP printers with Jetdirect cards will list their AppleTalk names and zones on the test page. Having determined this informatoin we put it all together as part of the **ppad interface** command, like so:

```
# ppad interface myprn atalk "Joe's Mac Printer:LaserWriter@CC Zone"
```

Assuming it does not exist already, this command creates a new printer queue called `myprn`. Its AppleTalk name, from the Chooser, is `Joe's Mac Printer`. The AppleTalk type is `LaserWriter`. The zone is `CC Zone`. (If the printer queue did exist already, its configuration would be modified. This will be covered in a later section.)

Hiding an AppleTalk Printer

You may wish to prevent Macintosh users from bypassing the PPR print queue and printing to the printer directly as they could do if they could choose it in the Chooser. You can hinder them by hidding the printer from the Chooser. PPR hides an AppleTalk printer from the chooser by changing its AppleTalk type. This works because the Macintosh LaserWriter driver only lists network names with a type of `LaserWriter`. If you ask PPR to hide a printer, then every time it sends a job to the printer it will check if it is hidden and hide it if it is not. However, the AppleTalk type will revert to `LaserWriter` and the printer will thus become unhidden every time the printer is turned off and back on again.

To instruct PPR to hide the printer, simply enter a string other than `LaserWriter` for the *`type`* part of the address. Whenever PPR tries to send a job to the printer, it will first attempt to find it using the type you specify. If that fails, PPR will try again using a type of `LaserWriter`. If the printer is found with a type of `LaserWriter` (i.e., it isn't hidden), PPR will change the type to whatever you specified. For example, if we wanted to hide a printer, we could enter its address using this command:

```
# ppad interface myprn atalk "Joe's Mac Printer:LaserShared@CC Zone"
```

The exact type name you use to hide a printer matters little unless you want another spooler to be able to print to it at the same time. In that case, you should use the same type name as that spooler will use. The type `ATTShared` is compatible with the NCR server for Macintosh Clients. The name `LaserShared` is said to be used by certain Apple spoolers. When the Windows NT spooler 'captures' a printer it changes the type name of the printer to the computer name of the machine the NT spooler is running on. For example, if PPR is sharing our example printer with an NT computer name `ALICE` which has captured it, this would be the command to use:

```
# ppad interface myprn atalk "Joe's Mac Printer:ALICE@CC Zone"
```

Adding a TCP/IP Connected Printer

The interface `tcpip` can be used to print to TCP/IP connected printers using the SocketAPI and AppSocket protocols. HP printers with JetDirect" cards implement SocketAPI. To set up an HP 4M+" we might use this command:

```
# ppad interface my4m tcpip my4m.prn.trincoll.edu:9100
```

In this example, `my4m` is the name of the queue we are creating. `my4m.prn.trincoll.edu` is the DNS name of the printer. We could have used the IP address instead if we had wished. The number `9100` is the port that the `tcpip` interface should connect to. (On a JetDirect card port 9100 accepts a data stream in the same format as the serial or parallel interface would want.)

We can also use this interface to print to Extended Systems Pocket Print Servers. These devices are small boxes with an Ethernet port on one end and a parallel port connector on the other. In their default configuration, they listen for SocketAPI connections on TCP port 9100. However, since the parallel port on these print server is unidirectional, they can only convey data from the spooler to the printer and not from the printer to the spooler. Therefore we must tell PPR not to expect to expect to receive any sort of data in reply from the printer. Here are the commands:

```
# ppad interface qmsps410 tcpip qmsps410.prn.trincoll.edu:9100
# ppad feedback qmsps410 false
```

Setting `feedback` to `false` if the communications channel does not support two−way communication is very important. If you fail to do so, PPR will almost certainly attempt operations, such as queries and handshaking, which require two way communications. The result will be that the queue will get stuck, either before printing anything, or after the first job has been printed. If this happens, you must forcibly halt the queue, change the setting, and restart the queue, like this:

```
# ppop halt qmsps410
# ppad feedback qmsps410 false
# ppop start qmsps410
```

However, you should not get in the habit of setting `feedback` to `false` for no reason. Setups with `feedback` set to `false` should be considered crippled. If a printer doesn't support two−way communication with a given interface, such as `tcpip`, you should consider usinging a different interface, such as `atalk`. Among the harmful effects of lack of two−way communication is that failure of the job due to PostScript errors will not be detected.

Using a Printer Connected to a Parallel or USB Port (Old Method)

PPR provides a simple (even simplistic) interface program which can be used to communicate with a printer connected a port on the print server, such as a parallel or USB port. It is called `simple`. When printing through a server port port one must be sure that the user `ppr` has permission to write to the port. This is one way you could set it up a print queue for a parallel port:

```
# chown ppr /dev/lp0
# chmod 600 /dev/lp0
# ppad interface nearprn simple /dev/lp0
```

This interface program does not support bidirectional communication, so PPR will not detect PostScript errors when printing through this interface. The default `feedback` setting for this interface program is `false`, so there is no need to set it with **ppad feed**. The `simple` interface program is not able to read the printer status lines of a parallel port. These status lines often convey valuable information such as that the printer is out of paper. Due these limitations, you should use the `simple` interface to print to parallel and USB ports only if the `parallel` and `usblp` interface programs won't work on your system.

Using a Printer Connected to a Parallel Port (New Method)

PPR also has an interface program designed especially for parallel ports. It is called `parallel`. When printing through a parallel port we must be sure that the user `ppr` has permission to write to the port. This is one way you could set it up:

```
# chown ppr /dev/lp0
# chmod 600 /dev/lp0
# ppad interface nearprn parallel /dev/lp0
```

The default for this interface is `feedback false`. If your printer and operating system support bidirectional parallel port operation, then you should definitely inform PPR of the fact using a command like this one:

```
# ppad feedback nearprn true
```

If you do this, then PPR will be able to detect job failures due PostScript errors.

Using a Printer Connected to a USB Port (New Method)

PPR provides an interface for USB–connected printers. It is still experimental and its features subject to change, so about all we can say about it is that you might set it up like this:

```
# chown ppr /dev/usb/lp0
# chmod 600 /dev/usb/lp0
# ppad interface nearprn usblp /dev/usb/lp0
```

Using a Printer Connected to a Serial Port

PPR has an interface called `serial` for sending jobs to printers connected to the print server's serial ports. As with the `parallel` interface, you must set the file permissions on the device file in the `/dev/` directory so that the user `ppr` can write to the port. You will also want to set the baud rate:

```
# chown ppr /dev/tty0
# chmod 600 /dev/tty0
# ppad interface nearprn serial /dev/tty0
```

```
# ppad options nearprn 'speed=9600 bits=8 parity=none'
```

This may well be the most difficult interface to set up because of the lack of standards for connecting printers to RS−232 ports. The problem is that RS−232 was originally designed with but one purpose and that was to connect a teletype machine to a modem. It says nothing about connecting printers to computers. Thus there is a lack of consistency in the way RS−232 connection printers implement handshaking and flow control. To describe the RS−232 interface, the construction of null modem cables, the use of breakout boxes for troubleshooting and the quirks of the serial driver in varous Unix variants would require a document much larger than this one and is a task to which the author of this document does not feel himself equal. Because of the the potential complexity of serial connexions, this interface has many options, only three of which have been hinted at in the example above. The remainder of the options are described in the ppad(8) manpage.

RS−232 ports are invariably bidirectional, so the default for `feedback` for this interface is `true`.

Adding Printers With Other Connexion Methods

To learn about the interfaces which support other means of connexion, refer to the ppad−interfaces(8) manpage. The manpage also provides more details about the features and options of the interfaces described above.

Selecting a PPD File

Once the printer has been added, you should choose a PPD file that accurately describes and inform PPR of your choice. Likely you will choose one of the files in `/usr/share/ppr/ppd/`. The files in this directory have descriptive names. A print queue's PPD filename is set with the **ppad ppd** command:

```
# ppad ppd myprn "QMS-PS 410"
```

Using the correct PPD file is very important since the wrong PPD file can prevent printer features such as multiple input trays and duplexing from working. If you cannot find a PPD file which was designed for the precise make and model of your printer, try to find one that is close. It is important not to use the PPD file for a level 2 PostScript printer with a level 1 PostScript printer. Also, the PPD file should define the bins which really exist on your printer and should have the correct code for selecting them. Finally, it is best that the font list be correct. A font list which leaves some fonts out is probably better than one which names fonts the printer does not have. Here are some PPD files you might try if you don't have anything closer:

```
Apple LaserWriter II NT
Personal LaserWriter 320
HP LaserJet IIISi PostScript
HP LaserJet 4Si 4SiMX PS 600dpi
HP LaserJet 4
HP LaserJet 4M DSC
HP LaserJet 4 Plus
HP LaserJet 4M Plus DSC
QMS-PS 410
QMS-PS 810
QMS-PS 820
```

If you choose either the `HP LaserJet 4M DSC` or `HP LaserJet 4M Plus DSC` PPD file you must make sure your clients are using the vary same PPD file and not the one supplied by HP. If you forget, your users won't be able to select bins correctly.

If you can not find anything that is close, the printer manufacturer may be able to supply a suitable PPD file. Very often it can be found on the Macintosh or MS−Windows driver diskettes which come with the printer. If not, you may be able to obtain a suitable file from ftp://ftp.adobe.com/.

If you are really, abitious, you can obtain the PostScript Printer Description File Format Specification from http://partners.adobe.com/asn/developer/PDFS/TN/5003.PPD_Spec_v4.3.pdf. That document, together with a good printer manual, will give you the information you need to write your own PPD file or to modify an existing one to work with your printer.

Any new PPD files should be converted to Unix line termination (FTP will do this for you if you transfer them in ASCII mode). You may put new PPD files in a directory other than `/usr/share/ppr/ppd/`, as long as you specify the path in the **ppad ppd** command. When PPR opens the PPD file, PPD file names starting with `/` are used as is, others are looked up in the PPD file index created by **ppr−index ppds**.

Adding a Comment

It is recomended that you set the comment field in each printer's configuration. You set it like this:

```
# ppad comment myprn 'My very own printer, but you may use it'
```

Using Ghostscript with PPR

Using Ghostscript, a freely available PostScript interpreter, it is possible to print PostScript jobs on non−PostScript printers. This is especially useful for driving inexpensive inkjet printers connected over parallel or USB cables. Of course, large laser printers and network printers will also work. The only requirement is that the communications path have sufficient bandwidth to quickly transfer the large bitmaps produced by Ghostscript.

Previous versions of PPR had special printer interface wrapper programs which accepted PostScript from PPR, processed it with Ghostscript, and sent the Ghostscript output to the printer by using one of the real interface programs. However, these special interface wrapper programs are obsolete. We will describe only the new mechanism here.

PPRassumes that you have installed Ghostscript and the Ghostscript printer drivers that you intend to use. PPR can use any compiled−in Ghostscript driver as well as CUPS and IJS drivers including those from HP and the Gimp Print project.

It is easiest to configure a printer queue to use Ghostscript is to use a special PPD file. These PPD files describe the capabilities of the printer−Ghostscript−driver combination and have a special line begining with `*pprRIP:` which tells PPR to use Ghostscript as the RIP (Raster Image Processor) and which driver and options to select. For example, these commands will set up an Epson Stylus C62" attached to the first parallel port:

```
# ppad interface color_inkjet /dev/lp0
# ppad ppd color_inkjet "Epson Stylus C62 Ghostscript"
```

Assuming you have the Gimp Print IJS drivers installed, that is all you have to do.

Here are the special PPD files supplied with PPR:

```
HP DeskJet 500 Ghostscript
```

```
HP DeskJet 550C Ghostscript
HP LaserJet III Ghostscript
Epson Stylus C62 Ghostscript
NEC Pinwriter 6 Ghostscript
```

If this selection seems a little limited, it is because these PPD files were built by hand for the printers which PPR's author used. He hopes to include a broader selection in the future.

If you have CUPS installed, you can use its drivers for HP PCL, Epson−compatible dotmatrix, and Epson Stylus printers simply by selecting the cooresponding PPD file as supplied with CUPS. These are the PPD files supplied with CUPS version 1.1.16:

```
/usr/share/cups/model/deskjet.ppd
/usr/share/cups/model/deskjet2.ppd
/usr/share/cups/model/dymo.ppd
/usr/share/cups/model/epson24.ppd
/usr/share/cups/model/epson9.ppd
/usr/share/cups/model/laserjet.ppd
/usr/share/cups/model/okidat24.ppd
/usr/share/cups/model/okidata9.ppd
/usr/share/cups/model/stcolor.ppd
/usr/share/cups/model/stcolor2.ppd
/usr/share/cups/model/stphoto.ppd
/usr/share/cups/model/stphoto2.ppd
```

PPR understands the extra information in a CUPS−Ghostscript PPD file and can invoke the correct driver without additional help. For example, if we want to drive a HP LaserJet 4" that doesn't have the PostScript option installed, but does have a JetDirect card, we could set it up with these commands:

```
# ppad interface johnsprn tcpip johnsprn.prn.notacorp.com:9100
# ppad ppd johnsprn /usr/share/cups/model/laserjet.ppd
```

That really is all there is to it.

We absolutely must mention the Foomatic project. Foomatic is an effort to catalog as many printers and Ghostscript drivers as possible in an XML database. This database is used to generate PPD file which, when used together with a special Perl script that invokes Ghostscript, can support a huge list of printers. Instructions for using Foomatic with PPR can be found at http://www.linuxprinting.org/ppr−doc.html.

Your final option for Ghostscript RIP support is to choose a generic PPD file such as `HP LaserJet 4M DSC` and then use the **ppad rip** command to select the Ghostscript driver and options. For example:

```
# ppad ppd myprn "HP LaserJet 4M Plus DSC"
# ppad rip ppr-gs -sDEVICE=ljet4
```

You should refer to the ppad(8) manpage for a more complete discussion of **ppad rip**.

Viewing the Configuration

You may view a printer's configuration with the **ppad show** command, like this:

```
# ppad show chipmunk
Printer name: chipmunk
  Comment: David Chappell's printer
```

```
Interface: atalk
  Address: "Mac Laser Printer :LaserWriter@MCEC"
  Options:
  JobBreak: signal (by default)
  Feedback: yes (by default)
  Codes: Binary (by default)
PPDFile: QMS-PS 800 II
  Default Filter Options: level=1 colour=False resolution=300 freevm=402509
    mfmode=CanonCX
  Bins:
  OutputOrder: ppd
Alert interval: 13 (send alert every 13 errors)
  Alert method: mail
  Alert address: David.Chappell@trincoll.edu
Flags: no no (banners discouraged, trailers discouraged)
Charge: no charge
Switchset:
```

Some of these configuration options which you see in the **ppad show** output have already been explained, all of them are described in the ppad(8) manpage.

Deleting a Printer

If a printer queue is no longer needed it may be deleted like this:

```
# ppad delete myprn
```

Making Groups of Printers

You may wish to form groups of printers. A group is assigned a name and member printers are specified. Jobs may be submitted to the group and PPR will decide which printer the job will be printed on. It is simplest if all the member printers are of the the same make and model, but PPR can often smooth over the differences, especially when using automatic bin selection and reasonably good printer drivers such as LaserWriter 8. A group is formed when the first member is assigned. Members are assigned to a group like this:

```
# ppad group add ourgroup myprn
# ppad group add ourgroup yourprn
```

Members may be removed from groups like this:

```
# ppad group remove ourgroup myprn
```

Removing all members from a group does not delete it. A group is deleted like this:

```
# ppad group delete ourgroup
```

Members may be added and removed even while jobs are being printed. If a printer is removed while it is printing a job for that group, it will finish that job, but it will not print any more jobs for that group. If a printer is added, it will be used as soon as it is idle and there is a job which needs a printer. If the group has no members, its jobs will not be printed until members are added.

It is recomended that you set a group's comment field. The comment field is set in this manner:

```
# ppad group comment ourgroup 'The printers we share'
```

Each group has a parameter called `Rotate`. If `Rotate` is `false`, then when the time comes to print a job, PPR uses the first idle printer, starting with the first member of the group. This will probably mean that the printers at the begining of the group's members list will get used more often. If `Rotate` is set to `true`, PPR will try to use the printers in round–robin fashion. `Rotate` is `true` by default, it may be set to `false` with a command like this one:

```
# ppad group rotate ourgroup false
```

The configuration of a group may be viewed with the **ppad group show** command, like this:

```
# ppad group show ourgroup
Group name: ourgroup
Comment: A printer at random
Members: myprn, yourprn
Rotate: True
Default Filter Options:
Switchset:
```

Adding PPR Printers to Samba

If you are using the SMB server called Samba you can use it to share PPR printers. It is recomended that you use Samba version 1.9.18 or later. For information about obtaining refer to http://www.samba.org/.

To share PPR printers through Samba, you must add a few lines to Samba's configuration file. Samba's configuration file is often called `/usr/local/samba/lib/smb.conf`.

Somewhere after the section called `[global]` you should add two lines which read:

```
include = /usr/lib/ppr/lib/smb-protos.conf
include = /etc/ppr/smb-include.conf
```

After you have modified `smb.conf`, you should run **ppr2samba** which is a utility which creates the file `/etc/ppr/smb-include.conf`. This file will contain a Samba share definition section for each printer and group you have set up in PPR. You should re–run **ppr2samba** after every time you create or delete a printer or group in PPR.

To allow guest users to have meaningful names in the queue listing and to delete their jobs, you should add the Samba guest user to the access control file `/etc/ppr/acl/pprprox.allow`. All that is needed is a line with the user name on it.

This procedure will share all PPR printers through Samba. If you want to exclude certain printers you should refer to the ppr2samba(8) man page.

You should also refer to the ppr2samba(8) man page if you want to set up special features for public access computers or if you want to set up Samba so it can offer printer drivers to `Microsoft Windows 95` clients for automatic installation.

Adding PPR Printers to the PPR AppleTalk Server

Sharing a printer with Macintosh clients over AppleTalk is simple. Simply use a command like this:

```
# ppad addon myprn "My Printer"
```

To share a group, do this:

```
# ppad group addon ourgroup papname "Our Group"
```

If you can't see the new names in the chooser within a minute or so, make sure that **papd** is running. If it is, it may not be able to automatically detect that the configuration has changed. Try doing this:

```
# /usr/lib/ppr/bin/papd --reload
```

If that doesn't do the trick, you may find clues in `/var/spool/ppr/logs/papd`. You can use this command to display the end of it:

```
# /usr/lib/ppr/bin/papd --tail
```

This will display the last few lines of the file and then wait, displaying new lines as they are added.

PPR's LPD (RFC 1179) Server

An LPD server, called **lprsrv** is provided with PPR. This server conforms to the remote printing protocol described in RFC 1179. When this server receives a job for a PPR printer, it invokes **ppr** and passes the file to it. If PPR's LPD server receives a job for queue which is not defined in PPR, it passes the job to the system's normal print spooler.

PPR's LPD server doesn't require much set up since it simply shares all of your PPR printers and all of the native spooling system's printers.

Before using PPR's LPD server, it is necessary to disable any LPD server you are currently using. Once any pre−existing LPD server is disabled, restart **pprd** so that it can start accepting connexions on port 515 and launching **lprsrv** to handle them.

Automatic Bin Selection

You must decide if you want to use PPR's automatic bin selection features on a certain printer. If you do, you must specify the names of the bins on the printer and the type of paper in each bin. If you do not tell PPR that the printer has bins, PPR will ignore the subject. It will assume that the printer has the proper paper to print any job you throw at it. If you tell PPR the name of each bin and the kind of paper, PPR will scrutenize each job and print it only when the required paper is mounted on one of the bins.

The easiest way to tell PPR what bins the printer has is to instruct it to read the list from the PPD file. The command to do this is:

```
# ppad bins ppd myprn
```

When this is done, you can view the list you got with the command **ppad show**:

```
# ppad show myprn
Printer name: myprn
Comment: My very own printer
Interface: atalk
Address: Keep Out:LaserWriter@Clubhouse
Options:
JobBreak: signal/pjl
Feedback: yes (by default)
Codes: Binary (by default)
```

```
Alert interval: 5 (send alert every 5 errors)
Alert method: mail
Alert address: alertreaders@oldivy.edu
Flags: no no (banners discouraged, trailers discouraged)
Charge: none
PPDFile: HP LaserJet 4M DSC
Bins: Upper, Lower, MP, Envelope
OutputOrder: ppd
Default Filter Options: level=2 colour=False resolution=600 freevm=679680
    mfmode=ljfour
Switchset:
```

You can then delete any bin names which represent hardware options you have not chosen to install:

```
# ppad bins delete myprn Envelope
# ppad bins delete myprn Lower
```

Submitting Jobs to PPR

All jobs enter PPR's queue through the program **ppr**. The Macintosh print server **papd** invokes **ppr** as do, Samba and the LPR/LPD compatible server **lprsrv**.

Unix users invoke **ppr** (the program, not the spooler system) directly. To make this easier, `/usr/bin/ppr` is a symbolic link to `/usr/ppr/bin/ppr`. For a complete description of **ppr**'s options, see the ppr(1) man page. A description of some of the more important ones follows.

Simple Examples

When invoking **ppr**, the `-d` switch may be used to specify the destination, that is, a printer or group of printers. For example:

```
$ ppr -d myprn report1.ps
```

If **ppr** is invoked without specifying the name of a file to print, it reads the file from stdin. For example, we can print a document using PPR on a remote system using this command:

```
$ cat report1.ps | rsh cberry 'ppr -d hisprn'
```

The first thing **ppr** does is analyze the input file to determine whether it is PostScript or not, and if not, what it is. If it is not PostScript, **ppr** will attempt to convert it to PostScript before it is placed in the queue. For example, ASCII text files can be printed:

```
$ ls -l /usr/bin | ppr -d myprn
```

Choosing Options

When submitting a job, you may want to specify additional options. These options can do things such as select multiple copies, invoke printer features such as duplex, or select paper trays.

When submitting the job from the Unix shell, you just add the options to the **ppr** command line. When the job arrives through a network server such as Samba, **papd**, or **lprsrv** it is more difficult to select options.

The easiest thing to do in this latter case is to set a switchset. A switchset is a set of options associated with a queue. This feature is described later in this section. The switchset method has the advantage that a switchset established in this way applied to all jobs no matter how they arrive. This consistency can prevent confusion.

With some network servers there are additional ways to specify options which apply only to jobs submitted through it. These methods will be described later in this section.

Duplex Options

The available duplexing options are many and somewhat confusing. Let us start with a simple one:

```
$ ppr -d myprn --feature Duplex=DuplexNoTumble mydoc.ps
```

This instructs PPR to extract the code from the `*Duplex DuplexNoTumble` line in the PPD file and insert it in the document setup section of `mydoc.ps`. Code inserted in this way will override pre–existing duplex code in most cases.

Suppose though that you wish to allow users to continue to select the duplex mode, perhaps by using the Macintosh driver LaserWriter 8 with an appropriate PPD file, but you wish to make duplex printing the default. On some printers you can use the front panel to select duplex, but PPR wouldn't know you had done this, it would believe the printer was operating in simplex mode, thus its printer accounting sheet counts would be thrown off. Therefore, it would be better to invoke **ppr** like this:

```
$ ppr -d myprn -R duplex:duplex mydoc.ps
```

The option `-R duplex:duplex` instructs PPR to take note of comments within the PostScript which indicate which duplex mode is being invoked. The second occurence of the word `duplex`, after the colon, means to invoke ordinary duplex mode if no such comments are found.

Other Printer Options

In addition to duplexing, you can control any feature described in the printer's PPD file. You do this by using the `--feature` option with an appropriate value. The list of available feature depends on your printer, or more precisely, on the PPD file which you have told PPR to use. To see the full list of printer features described in the PPD file and the `--feature` need to activate then, do this:

```
$ ppr -d myprn --feature
PageSize
 -->Letter 8 1/2 x 11 in          --feature PageSize=Letter
    Legal 8 1/2 x 14 in           --feature PageSize=Legal
    A4 210 x 297 mm               --feature PageSize=A4
    Executive 7 1/4 x 10 1/2 in   --feature PageSize=Executive
    Env Comm10 4 1/8 x 9 1/2 in   --feature PageSize=Comm10
    Env Monarch 3 7/8 x 7 1/2 in  --feature PageSize=Monarch
    Env DL 110 x 220 mm           --feature PageSize=DL

PageRegion
 -->Letter 8 1/2 x 11 in          --feature PageRegion=Letter
    Legal 8 1/2 x 14 in           --feature PageRegion=Legal
    A4 210 x 297 mm               --feature PageRegion=A4
    Executive 7 1/4 x 10 1/2 in   --feature PageRegion=Executive
    Env Comm10 4 1/8 x 9 1/2 in   --feature PageRegion=Comm10
    Env Monarch 3 7/8 x 7 1/2 in  --feature PageRegion=Monarch
    Env DL 110 x 220 mm           --feature PageRegion=DL
```

```
InputSlot
 -->Upper Tray                  --feature InputSlot=Upper
    Lower Tray                  --feature InputSlot=Lower
    Envelope Feeder             --feature InputSlot=Envelope

Manual Feed
    True                        --feature ManualFeed=True
 -->False                       --feature ManualFeed=False

Duplex
 -->None                        --feature Duplex=None
    Long Edge Binding           --feature Duplex=DuplexNoTumble
    Short Edge Binding          --feature Duplex=DuplexTumble

Output Bin
 -->Upper - Face Down           --feature OutputBin=Upper
    Lower - Face Up             --feature OutputBin=Rear

Resolution Enhancement
 -->Printer Default             --feature Smoothing=PrinterDefault
    On                          --feature Smoothing=True
    Off                         --feature Smoothing=False
```

As you can see, the list of possible settings is shown below each feature. The setting is described on the left and the `--feature` option needed to invoke it will be shown on the right. For example, we can see that in order to print from the lower tray, we would use a command like this:

```
$ ppr -d myprn --feature InputSlot=Lower mydoc.ps
```

Multiple Copy Options

PPR is capable of printing multiple copies of a job. It is also capable of printing collated copies. The number of copies may be selected when **ppr** is invoked:

```
$ ppr -d myprn -n 3 mydoc.ps
```

This prints 3 copies of the file `mydoc.ps`. By default, PPR prints uncollated copies, that is, 3 copies of page 1, 3 copies of page 2, etc. In contrast, when printing collated copies, it prints 1 copy of page one, 1 copy of page 2, on to the end of the document and then repeats until it has printed the required number of copies. We can print collated copies with this command:

```
$ ppr -d myprn -n 3 -n collate mydoc.ps
```

When there is no charge for printing pages on a particular printer, if you do not use an `-n` switch, PPR does not attempt to influence the number of copies to be printed. This means that if the document contains code to invoke multiple copy features of the printer, PPR may not be able to correctly determine the number of pages printed. Thus, the number of sheets quoted on the banner page and in the print log could be wrong. This changes if you have specified an amount of money to be charged for each page which is printed on the printer that is being used. If you have specified an amount, even $0.00, then the number of copies is forced to 1 if you do not specify it.

You may wish to allow the number of copies desired to be specified in the document. If you invoke **ppr** with the `-R copies` option, PPR will read any `%%Requirement:` comments which specify the number of copies or collating mode and obey them. You might use this command:

```
$ ppr -d myprn -n 1 -n collate -R copies mydoc.ps
```

This command tells PPR to read the copies count in `mydoc.ps`, collate the copies even if `mydoc.ps` does not request it, and to print 1 copy unless `mydoc.ps` contains a comment which specifies a different number of copies. However, if there is no charge for printing on this printer and the `-n 1` switch were absent and `mydoc.ps` contained the PostScript code but not the comments for multiple copies it would achieve multiple copies on the sly.

Using Option Switchsets

It is sometimes desirable to choose a set of options to be applied to all jobs entering a certain queue.

To set these options, use the **ppad switchset** command for a printer queue and the **ppad group switchset** command for a group queue.

For example, imagine that we have a printer called `mcec_1`. We want to create two queues for it called `mcec_sim` and `mcec_dup`. We want `mcec_sim` to print in simplex mode by default and `mcec_dup` to print in duplex mode by default. First we create the groups `mcec_sim` and `mcec dup` each of which contains the lone member `mcec_1`:

```
# ppad group add mcec_sim mcec_1
# ppad group add mcec_dup mcec_1
```

Now, jobs sent to either group will go to the same printer, but we will give each group a different set of options:

```
# ppad group switchset mcec_sim -R duplex:simplex
# ppad group switchset mcec_dup -R duplex:duplex
```

Now, when a job is submitted to `mcec_sim` or `mcec_dup`, the the option `-R duplex:simplex` or `-R duplex:duplex` to be inserted.

A switchset may be deleted by setting it to nothing. This command deletes the switchset for the printer `chipmunk`:

```
# ppad switchset chipmunk
```

Options for Jobs Received through Samba

Since Samba allows the administrator to choose any desired print command when creating a queue in `smb.conf`, it is possible to give a queue a special **ppr** command which includes the desired options.

However, this becomes clumsy if one is using **ppr2samba** to generate a `smb-include.conf` file to include in `smb.conf`, so this method is not recomended. Use a switchset instead.

Options for Jobs Received through lprsrv

There is no way to specify **ppr** command line options in any of the **lprsrv** configuration files, so you must use switchsets to force the use of options.

However, certain options, such as the number of copies, can be selected by the client and passed to **lprsrv** using the RFC 1179 protocol. Some operating systems, such as OSF and SunOS/Solaris extend the protocol to allow for furthur options. When **lprsrv** receives these options it attempts to convert them into appropriate **ppr** command line options.

Submitting Jobs Through Uprint

If you have Unix users, they are probably accustomed to submitting jobs with **lpr** or **lp**. You may also find that while some of your applications allow you to specify the command to be used for printing, others insist on using **lpr** or **lp**. In these cases, you might want to try PPR's Uprint system.

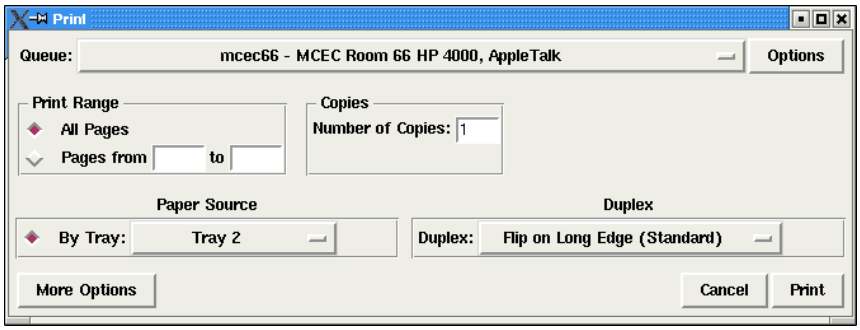
Uprint is a set of programs which mimic **lp**, **lpr**, **lpq**, and **lprm**. You can rename the versions of these programs that came with your system and replace them with the Uprint substitutes. When a Uprint substitute program is used, if the requested print queue is one that belongs to the system spooler, the renamed origional program will be invoked. If however the requested queue is a PPR queue, an appropriate command for **ppr** or **ppop** will be created and run.

For instructions for setting up Uprint, see the UPRINT(8) man page.

Submitting Jobs Using the Perl/Tk Interface

Of course, looking up all of the options for the **ppr** can be tedious, especially if you want to invoke several features simulaniously. If you are using X−Windows, is an easier way (or will be when it is finished). This easier way is the **ppr−panel** command. If **ppr−panel** is invoked with a filename on the command line, it will display a print dialog box, as seen in figure Figure 5.

Figure 5. Submitting a Job Using the Perl/Tk Interface



Notice the drop−down list by which one can select a destination print queue. If one wished to have a particular print queue already selected when the dialog box opens, one could use the `-d` option, like this:

```
$ ppr -d myprn myfile.ps
```

User Notification

PPR is capable to notifying the user when the job is finished, is deleted before completion, or cannot be completed for some reason. Since PPR can accept jobs from so many different sources, it needs to use many methods to send messages to users. Each of the available methods is implemented by a small program called a responder.

The **ppr** `-m` option selects the responder to be used to notify the user. The option `-r` sets the address to pass to the responder program.

The default responder is called ``write''. It writes a message to the users terminal if he is logged in or sends him an email messages if he is not. The default notification address is the name of the user who ran **ppr**.

The default responder and address may be changed by setting the `PPR_RESPONDER` and `PPR_RESPONDER_ADDRESS` environment variables respectively.

Notifying X Windows Users

X windows users may prefer to have a notification window pop up rather than have a message written so an xterm. To enable this, put the following commands in `.xsession` or some other appropriate X startup file:

```
/usr/ppr/bin/ppr-xgrant
PPR_RESPONDER=xwin
PPR_RESPONDER_ADDRESS=$DISPLAY
export PPR_RESPONDER PPR_RESPONDER_ADDRESS
```

Naturally, these environment variables should be set before any X clients are started. That means that these should be near the begining of `.xsession`.

Notifying Samba Users

There is a responder called ``samba'' which uses **smbclient** to send a message to the user. If you set up Samba printing as described in this manual then the ``samba'' responder will be used automatically.

If the user must have the message receiver running to receive the message. In MS−Windows for Workgroups and MS−Windows 95 the message receiver is a program called ``winpopup''.

Notifying lprsrv Users

The RFC 1179 protocol has provision for notifying users by email.

Queue Manipulation

Viewing the Queue

You may see what jobs are in the queue and what is happening to them by using the **ppop list** command:

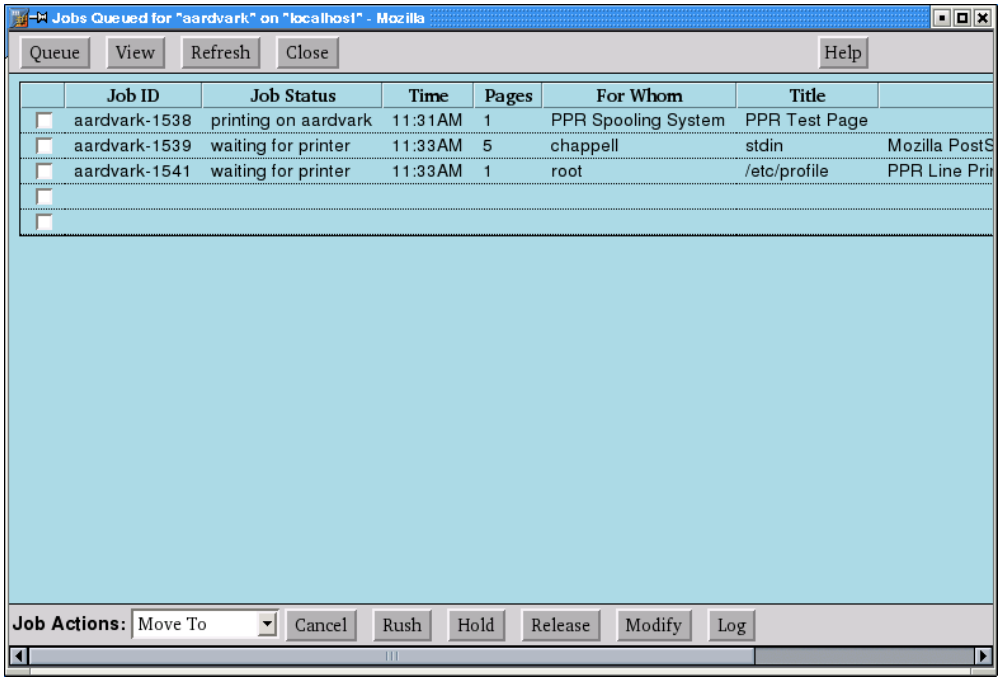
```
$ ppop list chipmunk
Queue ID        For                 Time    Pgs Status
-------------------------------------------------------------------------
chipmunk-2715   John Smith          11:53AM 007 printing on chipmunk
                                                14%, page 1
```

The above command only listed the jobs queued for a particular printer. In order to show all jobs for all printers use this command:

```
$ ppop list all
Queue ID        For                 Time    Pgs Status
-------------------------------------------------------------------------
chipmunk-2715   John Smith          11:53AM 007 printing on chipmunk
                                                14%, page 1
rat-2716        Pamela Andrews      11:55AM 007 printing on rat
                                                14%, page
```

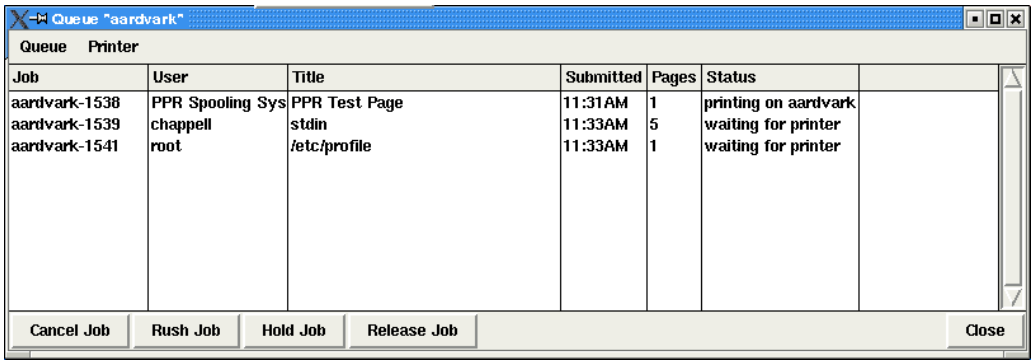
Of course, you can also view the queue using the web interface. To view the queue for a specific printer or group of printers, click on the printers icon in the PPR Web Control Panel and choose View Queue. To see all jobs, click on the icon labeled "Show All Queues". A sample queue listing window is shown in figure Figure 6.

Figure 6. Job Control



Or you might choose the Perl/Tk interface.

Figure 7. Viewing the Queue Using the Perl/Tk Interface



Canceling Jobs

If John Smith wants to delete his job should use this command:

```
$ ppop cancel chipmunk-2715
1 job was canceled.
```

He could have used another form of the command, a form which deletes all jobs which he has queued for chipmunk:

```
$ ppop cancel chipmunk
1 job was canceled.
```

Since on this occasion he had only one job, this command has the save effect as the first one.

If he were using the web interface, he could check the boxes next to the jobs he wishes the remove and then press the Cancel at the bottom of the window.

Operator's Duties for the PPR Spooler

There are certain commands which can only be used by an operator. The users `root` and `ppr` are operators. Any user whose name appears in the file `/etc/ppr/acl/ppop.allow` is an operator too.

Deleting Jobs

An operator has at his disposal an additional command for deleting jobs:

```
$ ppop purge chipmunk
```

This command will delete all jobs queue for the printer ``chipmunk'' no matter to whom they belong.

Mounting Media

If you have defined bins for a printer, before you can print on it you must indicate to PPR what kind of paper is in each bin. To see what kinds of paper (media) are mounted on a printer, use use the **ppop media** command:

```
# ppop media mrhp3si
Printer    Bin        Media
-------------------------------------------------------------
mrhp3si    Upper      letter
           Lower      letter
           Envelope   com10
```

To mount a different medium, use the **ppop mount** command:

```
# ppop mount mrhp3si Upper 3hole
```

You view the current contents of the list of known media types by issuing the command **ppad media show all**.

Stopping and Starting Printers

You can determine a printer's status with the **ppop status** command:

```
# ppop status mrhp3si
Printer       Status
-------------------------------------------------------------
mrhp3si       idle
```

We see that the printer is ``idle''. This means it is not printing right now but it is willing to begin printing. When it is printing, the name of the job it is printing is indicated:

```
# ppop status mrhp3si
Printer       Status
-------------------------------------------------------------
mrhp3si       printing mrhp3si-3876
```

A printer is stopped with the **ppop stop** command:

```
# ppop stop mrhp3si
```

If the printer was idle, it is stopped immediately:

```
# ppop status mrhp3si
Printer       Status
-------------------------------------------------------------
mrhp3si       idle
# ppop stop mrhp3si
# ppop status mrhp3si
Printer       Status
-------------------------------------------------------------
mrhp3si       stopt
```

If the printer is in the middle of a job, it will be stopped when the job is done. Until it stops, **ppop status** continues to display the name of the job being printed, but it also indicates that the printer is stopping:

```
# ppop status mrhp3si
Printer       Status
-------------------------------------------------------------
mrhp3si       printing mrhp3si-3876
# ppop stop mrhp3si
# ppop status mrhp3si
Printer       Status
-------------------------------------------------------------
mrhp3si       printing mrhp3si-3876 (stopping)
```

If you want to force a printer to stop immediately, you must use the **ppop halt** command:

```
# ppop halt mrhp3si
```

If the printer was printing a job, it stops in the middle of the job and the job is returned to the queue. If the job was submitted to a group of printers, it will be printed on the next member of the group to become idle. This means that the job may begin printing on another printer the moment you halt the printer on which it was origionally printing.

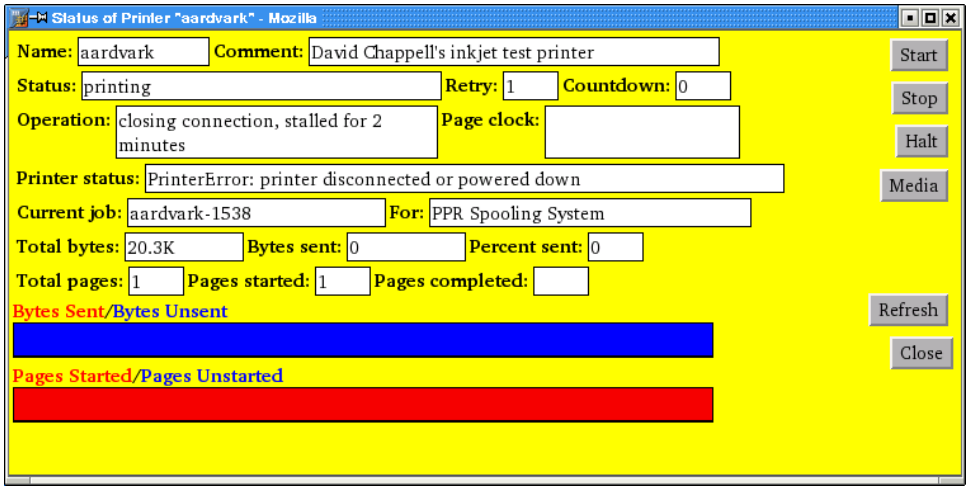
If a printer is stopt or stopping, you can start it again with the **ppop start** command:

```
# ppop start mrhp3si
```

The **ppop start** command can also be used when a printer has stopt printing due to a fault. In that case, the **ppop start** command will cause an immediate retry. Printer faults are discussed in section Section , Dealing With Printer Faults.

If you would rather, you can use the web interface to check a printer's status and stop and start it. To do this, click on the printer's icon in the PPR Control Panel and choose Printer Control. A window like that shown in figure Figure 8 will appear.

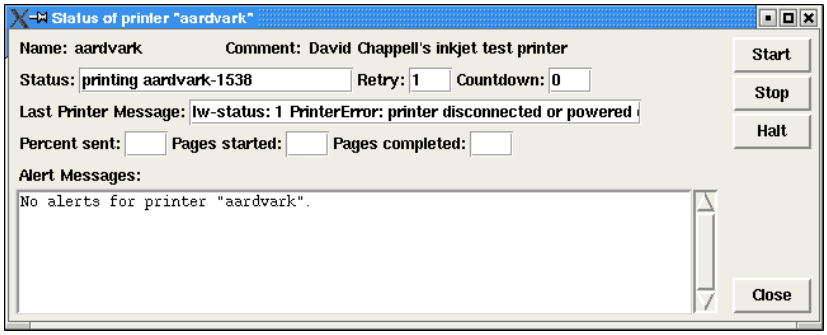
Figure 8. Printer Status and Control



Now instead of using commands such as **ppop stop** and **ppop start** you can simply press the coresponding buttons.

A third option is to use the Perl/Tk interface.

Figure 9. Printer Status as Displayed in the Perl/Tk Interface



More On Mounting Media

The information in this section only applies if you have set the printer up for media management as described in section Section , Automatic Bin Selection .

Each job which enters the print queue requires one or more types of paper. Most jobs require only one. If the required medium is not mounted, **ppop list** will indicate the types of media (generally various kinds of paper) that the job requires. Here is an example:

```
$ ppop list chipmunk
Queue ID         For                Time     Pgs Status
-------------------------------------------------------------------
chipmunk-2353    chappell           02:59PM 034 printing on chipmunk
                                                67%, page 29
chipmunk-2354    chappell           03:09PM 031 waiting for printer
chipmunk-2357    chappell           03:09PM 302 waiting for media
                                                letterhead
```

The safest way to change media is to stop the printer first. Obviously, it is best not to remove a paper tray until the printer has stopped. For this reason, the **ppop wstop** command is provided. This command stops the printer as soon as the current job is completed. The important point is that **ppop wstop** does not exit until the printer has stopped. That means you can make a shell script like this one:

```
#!/bin/sh
# Mount letterhead in chipmunk's upper bin.
echo "Please wait while the printer stops..."
ppop wstop chipmunk
echo "Please put letterhead in chipmunk's upper bin."
echo "Press RETURN when you have done so."
read response
ppop mount chipmunk Upper letterhead
ppop start chipmunk
echo "Thank you."
```

Dealing With Printer Faults

After most printer faults, PPR will try again soon. You can use **ppop status printer** to check on the status of a printer:

```
# ppop status chipmunk
Printer       Status
-------------------------------------------------------------
chipmunk      fault, retry 5 in 70 seconds
```

You may ask PPR to try a printer again immediately with the **ppop start** command:

```
# ppop start chipmunk
```

Each time a printer fault occurs a message is appended to the printer's alerts file. (If the previous fault occured more than one hour before, the alerts file is cleared first.) You may view a printer's alerts file at any time in this manner:

```
# ppop alerts chipmunk
Subject: Faults on "chipmunk"

Fri Feb 18 11:02:18 1994
"Mac Laser Printer:LaserWriter@MCEC" not found.
Printer placed in auto-retry mode.

Fri Feb 18 11:02:56 1994
"Mac Laser Printer:LaserWriter@MCEC" not found.
Printer placed in auto-retry mode.
```

If chipmunk is a new printer, the problem may be that the printer was given a name which ends with a space. If this is the case, PPR will not find it since it is looking for the printer without a space. We can either rename the printer, removing the space, or we can tell PPR to look for it with a space. Here is the command to do the latter:

```
# ppad interface chipmunk atalk "Mac Laser Printer :LaserWriter@MCEC"
# ppad start chipmunk
```

Holding and Releasing Jobs

If a job is in the queue but has not ues begun to print, it is possible to place it in the ``held'' state. You do this with the **ppop hold** command, like this:

```
# ppop hold chipmunk-2532
```

While it is held, a job will remain in the queue but it will not be printed. The ``Status'' field in the **ppop list** output will say ``held''. When you are ready to have it printed, you must use the command **ppop release**, like this:

```
# ppop release chipmunk-2532
```

PostScript Errors and Arrested Jobs

If the printer reports a PostScript error while the job is printing, PPR will finish transmitting the job but when it is done and would normally delete the job from the queue, it instead places the job in a special held state called ``arrested''. The defective job is preserved so that an attempt may be made to discover the cause of the PostScript error. For example, the following queue listing shows two arrested jobs:

```
Queue ID     For                Time    Pgs Status
------------------------------------------------------------------------
rat-2717     jandrews           12:10PM 001 arrested
                                            (PostScript error)
rat-2718     Abraham Adams      12:10PM 007 printing on rat
                                            14%, page 1
adshp4m-2719 jones              12:11PM 005 arrested
                                            (PostScript error)
```

You may view the error message, along with any other output the print job returned over the interface, by using the **ppop log** command. For instance, if the job `adshp4m-2719` is arrested, you can view the log like this:

```
# ppop log adshp4m-2719
%%[ Error: syntaxerror; OffendingCommand: --nostringval-- ]%%
%%[ Flushing: rest of job (to end-of-file) will be ignored ]%%
```

In this case, the PostScript code was probably generated incorrectly, so all you can do is cancel the job. If you think it might print on another printer, you can use the **ppop move** command to move it to another print queue and then use the **ppop release** command to take it out of the arrested state, like this:

```
# ppop move adshp4m-2719 mylaser
# ppop release mylaser-2719
```

Notice that moving the job changed its name, so we had to use the new name in the second command. While an arrested job can be deleted just like any other job, the administrators have a special command just for that purpose:

```
# ppop clean rat adshp4m
2 jobs were canceled.
```

The command above will delete all arrested jobs in the queues `rat` and `adshp4m`. If we imagine that the command above acted on the jobs shown in the queue listing at the start of this section, then it deleted the jobs

`adshp4m-2719` and `rat-2717` but left the job `rat-2718`. The **ppop clean** command will only delete arrested jobs.

We can also could have deleted all arrested jobs in the system:

```
# ppop clean all
2 jobs were canceled
```

If the printer does not have an interface which supports two way communication, then PostScript errors will not be detected. The interface `atalk` is one that supports two way communication, the interface `simple` is one that does not.

Backing Up PPR's Data

PPR stores its configuration entirely in `/etc/ppr/`. The PPR spooling system can be adequately rebuilt by installing PPR from scratch and then restoring `/etc/ppr/`.

The directories `/usr/lib/ppr/`, and `/usr/share/ppr/` contain only static data.

PPR stores temporary data (print jobs, client printing transfer files and such) in `/var/spool/ppr`. PPR continually adds files to `/var/spool/ppr/cache`, but these will be replaced automatically, so it is not essential that they be backed up. No files are added to `/usr/lib/ppr/cache`. PPR also writes into `/var/spool/ppr/logs/` and the subdirectories of `/var/spool/ppr/printers/` but these are throw away files. A possible exception is `/var/spool/ppr/logs/printlog` which you will want to back up if it is important to you.

Removing PPR

Removing PPR is not difficult but if you aren't careful you may leave some of its hooks in the operating system. In this section we describe the commands needed to remove PPR neatly. These commands are similar to those used in the RPM pacakage. The commands you will use vary a bit from operating system to operating system. In this section we will present typical commands.

First you should stop the spooler. Any easy way to do this is to use the Init script, like this:

```
# /etc/init.d/ppr stop
```

Next you should remove PPR's init scripts. These commands will work on most systems:

```
# rm /etc/rc?.d/[SK][0-9][0-9]ppr
# rm /etc/init.d/ppr
```

Of course, you may have to adjust them if your systems Init scripts are in differnt places.

and its Inetd or Xinetd configuration. For Xinetd, just delete the file, like this:

```
# rm /etc/xinetd.d/ppr
```

For Inetd you will have to edit `/etc/inetd.conf` to remove the lines for the PPR web−browser interface and lpr/lpd server. Don't forget to send SIGHUP to Inetd or Xinetd when you are done. While you are at it, you might as well remove your access rules from `/etc/hosts.allow`.

Next you should unhook PPR's UPRINT system, putting the real versions of commands such as **lpr** and **lpq** back where they were:

```
# /usr/lib/ppr/bin/uprint-newconf --remove
Restoring original spooler program names:

Files for lp should be in their normal locations.
Removing symbolic link "/usr/bin/lp".
Moving "/usr/bin/real-lp" back to "/usr/bin/lp".
Removing symbolic link "/usr/bin/cancel".
Moving "/usr/bin/real-cancel" back to "/usr/bin/cancel".
Removing symbolic link "/usr/bin/lpstat".
Moving "/usr/bin/real-lpstat" back to "/usr/bin/lpstat".

Files for lpr should be in their normal locations.
Removing symbolic link "/usr/bin/lpr".
Moving "/usr/bin/real-lpr" back to "/usr/bin/lpr".
Removing symbolic link "/usr/bin/lprm".
Moving "/usr/bin/real-lprm" back to "/usr/bin/lprm".
Removing symbolic link "/usr/bin/lpq".
Moving "/usr/bin/real-lpq" back to "/usr/bin/lpq".

Done.
```

Next you should remove PPR's crontab file:

```
# crontab -u ppr -r
```

Next you can remove all of PPR's files (including configuration files) with these commands:

```
# rm -r /usr/lib/ppr
# rm -r /usr/share/ppr
# rm -r /var/spool/ppr
# rm -r /etc/ppr
```

Finally you should remove the users `ppr` and `pprwww` and the group `ppr`. Here are the commands for Solaris or a typical Linux system:

```
# /usr/sbin/userdel ppr
# /usr/sbin/userdel pprwww
# /usr/sbin/groupdel ppr
```

Replacing a Printer

Printers are frequently replaced with newer models. What should the PPR operator do when this happens? One solution is to create a whole new queue for the new printer. An alternative is to adjust the configuration of the existing queue so that it points to the new printer. This latter method may minimize the disruption experienced by the users of the printer.

To modify a queues configuration we can use either the **ppad** command or the web interface's Printer Properties window.

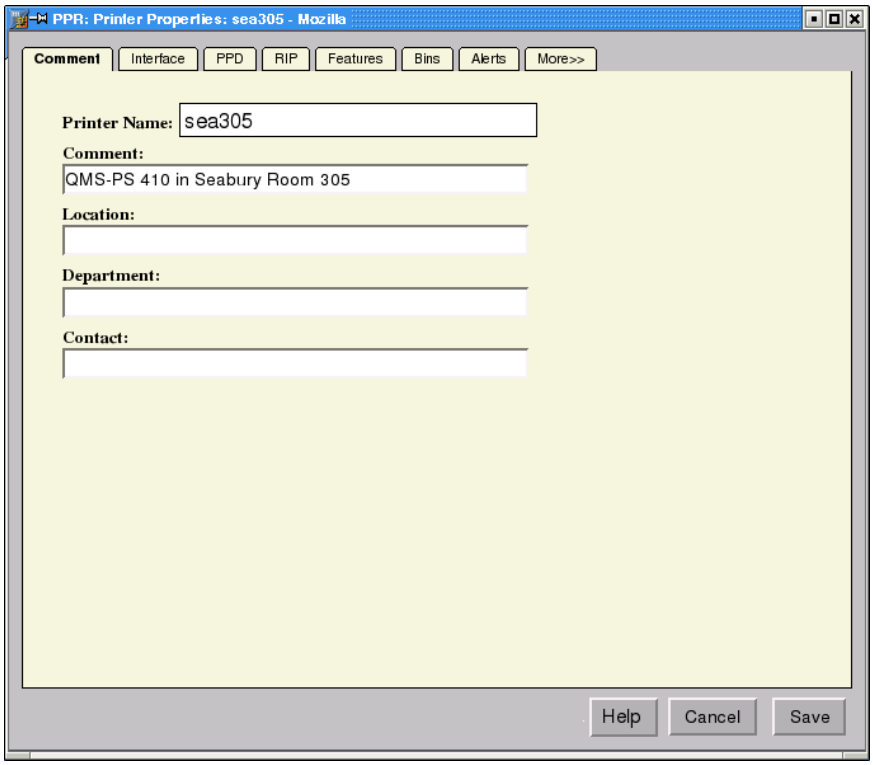
Basic Queue Modifications

In order to correctly modify a queue's configuration, it is necessary to understand its current configuration. The current configuration may be viewed with the **ppad show** command, like this:

```
# ppad show sea305
Printer name: sea305
  Comment: QMS-PS 410 in Seabury Room 305
Interface: serial
  Address: "/dev/ttyS0"
  Options: baud=9600 bits=8 parity=none
  JobBreak: control-d (by default)
  Feedback: yes (by default)
  Codes: Clean8Bit (by default)
PPDFile: QMS-PS 410
  Default Filter Options: level=1 colour=False resolution=300 freevm=336596
    mfmode=CanonCX
  Bins:
  OutputOrder: PPD
Alert frequency: 7 (send alert every 7 errors)
  Alert method: mail
  Alert address: alertreaders@oldivy.edu
Flags: no no (banners discouraged, trailers discouraged)
Charge: no charge
Switchset:
```

If we were to use the web interface, we would see the same information presented in a series of tabbed pages, as in figure Figure 10.

Figure 10. A Printer's Properties



Notice that the printer in this example is currently a QMS−PS 410 connected through a serial port. We will replace it with an HP 4M connected over the AppleTalk network. To do this, we must modify the settings of the ``Interface", ``Address", ``Jobbreak", ``PPD File", and, if we want to do things right, ``Comment". First, we will set the new interface and address:

```
# ppad interface sea305 atalk "Seabury Room 305:LaserShared@Seabury Zone"
```

Notice that the AppleTalk address is enclosed in quotes. This is necessary because it contains spaces. Also, notice that the device type portion of the AppleTalk address is ``LaserShared" rather than ``LaserWriter". This causes PPR to `hide' the printer by automatically changing its device type from ``LaserWriter" to ``Laser Shared"; if you don't want this to happen, use ``LaserWriter" instead of ``LaserShared". Here is what the configuration looks like now:

```
# ppad show sea305
Printer name: sea305
  Comment: QMS-PS 410 in Seabury Room 305
Interface: atalk
  Address: "Seabury Room 305:LaserShared@Seabury Zone"
  Options:
  JobBreak: signal (by default)
  Feedback: yes (by default)
  Codes: Binary (by default)
PPDFile: QMS-PS 410
  Default Filter Options: level=1 colour=False resolution=300 freevm=336596
    mfmode=CanonCX
  Bins:
  OutputOrder: PPD
Alert frequency: 7 (send alert every 7 errors)
  Alert method: mail
  Alert address: alertreaders@oldivy.edu
Flags: no no (banners discouraged, trailers discouraged)
Charge: no charge
Switchset:
```

Notice that changing the interface from `serial` to `atalk` automatically changed the `jobbreak` setting from `control-d` to `signal` which is the the default for the `atalk` interface. This is fine, but since the new printer is an HP 4M", we might want to use a Jobbreak setting of `signal/pjl` instead so that we can get nifty messages on the printer's display panel. We can make the change with this command:

```
# ppad jobbreak sea305 signal/pjl
```

Next, we must change the PPD file:

```
# ppad ppd sea305 "HP LaserJet 4M DSC"
```

Finally, any good system administrator will change the comment:

```
# ppad comment sea305 "HP 4M in Seabury room 305"
```

This printer did not have bins defined for automatic bin selection but if it had had, we would have had to alter the bin list to reflect the bins available on the new printer. The easiest way to do this would be to execute the command:

```
# ppad bins ppd sea305
```

This would add all possible bins for the new printer. After doing this it would have been necessary to use **ppad show sea305** to display the configuration and then use several commands along the lines of **ppad bins delete sea305 Envelope** to delete optional bins that are not installed on the new printer and bins that were present on the old printer but are not present on the new. Of course, once this is done, it is necessary to use the **ppop mount** command to mount media on the new bins. But, as we said, this print queue does not have bins defined, so we did not have to do any of this. Here we display the final configuration:

```
# ppad show sea305
Printer name: sea305
  Comment: HP 4M in Seabury room 305
Interface: atalk
  Address: "Seabury Room 305:LaserWriter@Seabury Zone"
  Options:
  JobBreak: signal/pjl
  Feedback: yes (by default)
  Codes: Binary (by default)
PPDFile: HP LaserJet 4M DSC
  Default Filter Options: level=2 colour=False resolution=600 freevm=709584
    mfmode=ljfour
  Bins:
  OutputOrder: PPD
Alert frequency: 7 (send alert every 7 errors)
  Alert method: mail
  Alert address: alertreaders@oldivy.edu
Flags: no no (banners discouraged, trailers discouraged)
Charge: no charge
Switchset:
```

Of course, if you are using the web interface you should go through the various tabs and make the changes described above. You should then press Save. The **ppad** commands show above will then be generated and executed automatically.

Changes for Samba

If you are using Samba, you should edit `smb.conf` and change the printer's comment, unless you are also using **ppr2samba**, in which case you can simply run **ppr2samba**. If you are using the web interface, the **ppr2samba** will be executed automatically when you press Save.

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Other Acknowledgements

PPR's N−Up dictionary is derived from the work of Don Markuson which he has placed in the public domain.

Some of PPR's TrueType to PostScrip type 3 font conversion code is derived from a program called ttf2ps which L. S. Ng posted to the Usenet news group `comp.sources.postscript`.

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